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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of: Palese, et al.

# 11

Application No.: 09/396,539

Group Art Unit: 1636

Filed: September 14, 1999

Examiner: T. McKelvey

For: RECOMBINANT NEGATIVE  
STRAND RNA VIRUS EXPRESSION  
SYSTEMS AND VACCINES

Attorney Docket No.: 7682-048

TRANSMITTAL OF SEQUENCE LISTING UNDER 37 C.F.R. § 1.821

Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

In accordance with 37 C.F.R. § 1.821, Applicants submit herewith a Sequence Listing in paper and computer-readable form pursuant to 37 C.F.R. §§ 1.821(c) and (e).

I hereby state that the content of the paper and computer-readable copies of the Sequence Listing, submitted in accordance with 37 C.F.R. §§ 1.821(c) and (e), respectively, are the same.

Respectfully submitted, by: *Jacqueline Penn*  
Reg No. 43,492

Date: June 19, 2001

*Laura A. Coruzzi*

30,742

Laura A. Coruzzi

(Reg. No.)

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SEQUENCE LISTING

(1) GENERAL INFORMATION:

- See E*
- (i) APPLICANT: Palese, Peter  
Garcia-Sastre, Adolfo
- (ii) TITLE OF INVENTION: RECOMBINANT NEGATIVE STRAND RNA VIRUS  
EXPRESSION SYSTEMS AND VACCINES
- (iii) NUMBER OF SEQUENCES: 63
- (iv) CORRESPONDENCE ADDRESS:  
(A) ADDRESSEE: Pennie & Edmonds  
(B) STREET: 1155 Avenue of the Americas  
(C) CITY: New York  
(D) STATE: New York  
(E) COUNTRY: USA  
(F) ZIP: 10036-2711
- 218*
- (v) COMPUTER READABLE FORM:  
(A) MEDIUM TYPE: Floppy disk  
(B) COMPUTER: IBM PC compatible  
(C) OPERATING SYSTEM: PC-DOS/MS-DOS  
(D) SOFTWARE: PatentIn Release #1.0, Version #1.25
- (vi) CURRENT APPLICATION DATA:  
(A) APPLICATION NUMBER: US 09/396,539  
(B) FILING DATE: 14-SEP-1999  
(C) CLASSIFICATION:
- (vii) PRIOR APPLICATION DATA:  
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(B) FILING DATE: 01-JUN-1994  
(C) CLASSIFICATION:
- (vii) PRIOR APPLICATION DATA:  
(A) APPLICATION NUMBER: US 09/106,377  
(B) FILING DATE: 29-JUN-1998  
(C) CLASSIFICATION:
- (viii) ATTORNEY/AGENT INFORMATION:  
(A) NAME: Coruzzi, Laura A.  
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(C) REFERENCE/DOCKET NUMBER: 7682-048
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(C) TELEX: 66141 PENNIE

(2) INFORMATION FOR SEQ ID NO:1:

- (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 21 base pairs  
(B) TYPE: nucleic acid

- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: genomic DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:1:

TACGAGGAAA TGTCCTGTT A

21

(2) INFORMATION FOR SEQ ID NO:2:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 19 amino acids
  - (B) TYPE: amino acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

Gln Leu Val Trp Met Ala Cys Asn Ser Ala Ala Phe Glu Asp Leu Arg  
1                      5                      10                      15  
Val Leu Ser

(2) INFORMATION FOR SEQ ID NO:3:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 16 amino acids
  - (B) TYPE: amino acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:3:

Thr Tyr Gln Arg Thr Arg Gln Leu Val Arg Leu Thr Gly Met Asp Pro  
1                      5                      10                      15

(2) INFORMATION FOR SEQ ID NO:4:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 95 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: genomic DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:4:

GAAGCTTAAT ACGACTCACT ATAAGTAGAA ACAAGGGTGT TTTTCATAT CATTTAACT 60

TCACCCTGCT TTTGCTGAAT TCATTCTTCT GCAGG 95

(2) INFORMATION FOR SEQ ID NO:5:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 95 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

C18 (ii) MOLECULE TYPE: genomic DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:5:

GAAGCTTAAT ACGACTCACT ATAAGCAAAA GCAGGGTGAA GTTTAAATGA TATGAAAAAA 60

CACCCTTGTT TCTACTGAAT TCATTCTTCT GCAGG 95

(2) INFORMATION FOR SEQ ID NO:6:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 68 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: genomic DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:6:

AGCTTAATAC GACTCACTAT AAGATCTATT AACTTCACC CTGCTTTTGC TGAATTCATT 60

CTTCTGCA 68

(2) INFORMATION FOR SEQ ID NO:7:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 60 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: genomic DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:7:

GAAGAATGAA TTCAGCAAAA GCAGGGTGAA GTTTAATAGA TCTTATAGTG AGTCGTATTA

60

(2) INFORMATION FOR SEQ ID NO:8:

- (i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 42 base pairs  
    (B) TYPE: nucleic acid  
    (C) STRANDEDNESS: single  
    (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: genomic DNA

C18 (xi) SEQUENCE DESCRIPTION: SEQ ID NO:8:

CCGAATTCTT AATACGACTC ACTATAAGTA GAAACAAGGG TG

42

(2) INFORMATION FOR SEQ ID NO:9:

- (i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 30 base pairs  
    (B) TYPE: nucleic acid  
    (C) STRANDEDNESS: single  
    (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: genomic DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:9:

CCTCTAGACG CTCGAGAGCA AAAGCAGGTG

30

(2) INFORMATION FOR SEQ ID NO:10:

- (i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 15 base pairs  
    (B) TYPE: nucleic acid  
    (C) STRANDEDNESS: single  
    (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic RNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:10:

CACCCUGCUU UUGCU

15

(2) INFORMATION FOR SEQ ID NO:11:

- (i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 15 base pairs  
    (B) TYPE: nucleic acid  
    (C) STRANDEDNESS: single  
    (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic RNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:11:

CACCCUGCUU UUACU

15

(2) INFORMATION FOR SEQ ID NO:12:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 15 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic RNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:12:

CACCCUGCUU CUGCU

15

(2) INFORMATION FOR SEQ ID NO:13:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 15 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic RNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:13:

CACCCUGUUU UUGCU

15

(2) INFORMATION FOR SEQ ID NO:14:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 16 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic RNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:14:

CACCCUUGCU UUUGCU

16

(2) INFORMATION FOR SEQ ID NO:15:

- (i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 15 base pairs  
    (B) TYPE: nucleic acid  
    (C) STRANDEDNESS: single  
    (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic RNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:15:

CACCCUGUUU UUACU

15

(2) INFORMATION FOR SEQ ID NO:16:

- (i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 15 base pairs  
    (B) TYPE: nucleic acid  
    (C) STRANDEDNESS: single  
    (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic RNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:16:

CACCCUGUUU CUGCU

15

(2) INFORMATION FOR SEQ ID NO:17:

- (i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 16 base pairs  
    (B) TYPE: nucleic acid  
    (C) STRANDEDNESS: single  
    (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic RNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:17:

CACCCUUGCU UUUACU

16

(2) INFORMATION FOR SEQ ID NO:18:

- (i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 16 base pairs  
    (B) TYPE: nucleic acid  
    (C) STRANDEDNESS: single  
    (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic RNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:18:

CACCCUUGUU UUUACU

16

(2) INFORMATION FOR SEQ ID NO:19:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 16 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic RNA

C<sub>18</sub>  
(xi) SEQUENCE DESCRIPTION: SEQ ID NO:19:

CACCCUUGUU UCUACU

16

(2) INFORMATION FOR SEQ ID NO:20:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 96 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:20:

CTAGACGCCC TGCAGCAAAA GCAGGGTGAC AAAGACATAA TGGAGAAAAA AATCACTGGG

60

TATACCACCG TTGATATATC CCAATCGCAT CGTAAA

96

(2) INFORMATION FOR SEQ ID NO:21:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 96 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:21:

GTTCTTTACG ATGCGATTGG GATATATCAA CGGTGGTATA CCCAGTGATT TTTTCTCCA

60

TTATGTCTTT GTCACCCTGC TTTTGCTGCA GGGCGT

96

(2) INFORMATION FOR SEQ ID NO:22:



- (i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 34 base pairs  
    (B) TYPE: nucleic acid  
    (C) STRANDEDNESS: single  
    (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:22:

ACTGCGATGA GTGGCAGGGC GGGGCGTAAT AGAT

34

(2) INFORMATION FOR SEQ ID NO:23:

- (i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 38 base pairs  
    (B) TYPE: nucleic acid  
    (C) STRANDEDNESS: single  
    (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:23:

CTAGATCTAT TACGCCCCGC CCTGCCACTC ATCGCAGT

38

(2) INFORMATION FOR SEQ ID NO:24:

- (i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 34 base pairs  
    (B) TYPE: nucleic acid  
    (C) STRANDEDNESS: single  
    (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:24:

ACTGCGATGA GTGGCAGGGC GGGGCGTAAT AGAT

34

(2) INFORMATION FOR SEQ ID NO:25:

- (i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 38 base pairs  
    (B) TYPE: nucleic acid  
    (C) STRANDEDNESS: single  
    (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:25:

CTAGATCTAT TACGCCCCGC CCTGCCACTC ATCGCAGT

38

(2) INFORMATION FOR SEQ ID NO:26:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 97 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic DNA

C18  
(xi) SEQUENCE DESCRIPTION: SEQ ID NO:26:

CTAGACGCCC TGCAGCAAAA GCAGGGTGAC AAAGACATAA TGGAGAAAAA AAATCACTGG

60

GTATACCACC GTTGATATAT CCCAATCGCA TCGTAAA

97

(2) INFORMATION FOR SEQ ID NO:27:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 96 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:27:

GTTCTTTACG ATGCGATTGG GATATATCAA CGGTGGTATA CCCAGTGATT TTTTCTCCA

60

TTATGTCTTT GTCACCCTGC TTTTGCTGCA GGGCGT

96

(2) INFORMATION FOR SEQ ID NO:28:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 30 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:28:

CGGAATTCTC TTCGAGCGAA AGCAGGAGTT

30

(2) INFORMATION FOR SEQ ID NO:29:

- (i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 51 base pairs  
    (B) TYPE: nucleic acid  
    (C) STRANDEDNESS: single  
    (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:29:

CATGGGTGAG TTTCGACCAA AATCTAGATT ATAAAATAGG ATACATATGC A

51

(2) INFORMATION FOR SEQ ID NO:30:

- C18  
(i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 51 base pairs  
    (B) TYPE: nucleic acid  
    (C) STRANDEDNESS: single  
    (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:30:

CATGGGTGAG TTTCGACCAA AATCTAGATT ATAAAATAGG ATACATATGC A

51

(2) INFORMATION FOR SEQ ID NO:31:

- (i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 43 base pairs  
    (B) TYPE: nucleic acid  
    (C) STRANDEDNESS: single  
    (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:31:

AATGTATCCT ATTTTATAAT CTAGATTTTG GTCGAAACTC ACC

43

(2) INFORMATION FOR SEQ ID NO:32:

- (i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 24 base pairs  
    (B) TYPE: nucleic acid  
    (C) STRANDEDNESS: single  
    (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:32:

GGCCACTAGT AGGTCGACGC CGGC

24

(2) INFORMATION FOR SEQ ID NO:33:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 22 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:33:

GCGCTGGCCA TCTTGCCAGC CA

22

(2) INFORMATION FOR SEQ ID NO:34:

- C<sub>18</sub>
- (i) SEQUENCE CHARACTERISTICS:
    - (A) LENGTH: 17 base pairs
    - (B) TYPE: nucleic acid
    - (C) STRANDEDNESS: single
    - (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:34:

AGAAAAAAAT CACTGGG

17

(2) INFORMATION FOR SEQ ID NO:35:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 17 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:35:

TTACGCCCCG CCCTGCC

17

(2) INFORMATION FOR SEQ ID NO:36:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 23 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single

(D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:36:

GCGCATCGAT AGGTCGACGC CGG

23

(2) INFORMATION FOR SEQ ID NO:37:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 55 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic DNA

C18  
(xi) SEQUENCE DESCRIPTION: SEQ ID NO:37:

GGCCATCGAT CCAATGGTTA TTATTTTCTG GTTTGGATTC ATCTTGCCAG TTGGG

55

(2) INFORMATION FOR SEQ ID NO:38:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 91 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:38:

ATGACTGGAT CCGCTAGCAT GGCCATCATT TATCTCATTC TCCTGTTAC AGCAGTGAGA

60

GGGGACCAGA TAGAAGAATC GCAAAAACCAG C

91

(2) INFORMATION FOR SEQ ID NO:39:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 39 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:39:

ATGACAGAAT TCGTCGACTT ATCTATTCAC TACAGAAAG

39

(2) INFORMATION FOR SEQ ID NO:40:

- (i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 53 base pairs  
    (B) TYPE: nucleic acid  
    (C) STRANDEDNESS: single  
    (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:40:

GCGCGAAGAC GCAGCAAAAG CAGGAGTTTA AGCTAGCATG GCCATCATTT ATC

53

(2) INFORMATION FOR SEQ ID NO:41:

- C18  
(i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 38 base pairs  
    (B) TYPE: nucleic acid  
    (C) STRANDEDNESS: single  
    (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:41:

CGATGGATCC GCTAGCTTGG AATCGATGGG GGTGTATC

38

(2) INFORMATION FOR SEQ ID NO:42:

- (i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 37 base pairs  
    (B) TYPE: nucleic acid  
    (C) STRANDEDNESS: single  
    (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:42:

ATCGATGAAT TCGTCGACTC AGATGCATAT TCTGCAC

37

(2) INFORMATION FOR SEQ ID NO:43:

- (i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 51 base pairs  
    (B) TYPE: nucleic acid  
    (C) STRANDEDNESS: single  
    (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:43:

ATGACTGTCTG ACCCATGGAA GTCAATCGAT GTTATGTTAA ACCAATTCCA C

51

(2) INFORMATION FOR SEQ ID NO:44:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 28 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:44:

GCGCGAATTC TCTTCGAGCA AAAGCAGG

28

(2) INFORMATION FOR SEQ ID NO:45:

C18 (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 18 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:45:

AGAGATGAAT TGCCGGTT

18

(2) INFORMATION FOR SEQ ID NO:46:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 6 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:46:

Glu Leu Asp Lys Trp Ala  
1 5

(2) INFORMATION FOR SEQ ID NO:47:

- (i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 12 base pairs  
    (B) TYPE: nucleic acid  
    (C) STRANDEDNESS: single  
    (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic RNA

- (ix) FEATURE:  
    (A) NAME/KEY: misc\_feature  
    (B) LOCATION: 9  
    (D) OTHER INFORMATION: /label= y  
                            /note= "y denotes c or u"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:47:

CCUGCUUUUG CU

12

(2) INFORMATION FOR SEQ ID NO:48:

- (i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 22 base pairs  
    (B) TYPE: nucleic acid  
    (C) STRANDEDNESS: single  
    (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic RNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:48:

AGUAGAAACA AGGGUGUUUU UU

22

(2) INFORMATION FOR SEQ ID NO:49:

- (i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 52 base pairs  
    (B) TYPE: nucleic acid  
    (C) STRANDEDNESS: single  
    (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic RNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:49:

AGUAGAAACA AGGGUGUUUU UUCAUAUCAU UUAACUUCAC CCUGCUUUUG CU

52

(2) INFORMATION FOR SEQ ID NO:50:

- (i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 53 base pairs



- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic RNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:50:

AGCAAAAGCA GGGUGAAGUU UAAAUGAUU GAAAAAACAC CCUUGUUUCU ACU

53

(2) INFORMATION FOR SEQ ID NO:51:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 30 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic RNA

C18

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:51:

AGAUCUAUUA AACUUCACCC UGCUUUUGCU

30

(2) INFORMATION FOR SEQ ID NO:52:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 43 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: unknown
  - (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic RNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:52:

AGUAGAAACA AGGGUGUUUU UUCAGAUCUA UUACGCCCCG CCC

43

(2) INFORMATION FOR SEQ ID NO:53:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 15 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: unknown
  - (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic RNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:53:

AGUAGAAACA AGGAG

15

(2) INFORMATION FOR SEQ ID NO:54:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 14 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: unknown
  - (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic RNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:54:

AGUAGAAACA AGAG

14

(2) INFORMATION FOR SEQ ID NO:55:

- C18
- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 12 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: unknown
  - (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic RNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:55:

CCUGCUUUCG CU

12

(2) INFORMATION FOR SEQ ID NO:56:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 53 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: unknown
  - (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:56:

CCATGGGTGA GTTTCGACCA AAATCTAGAT TATAAAATAG GATACATATG CAG

53

(2) INFORMATION FOR SEQ ID NO:57:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 15 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: genomic DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:57:

CCTGCAGAAG AATGA

15

(2) INFORMATION FOR SEQ ID NO:58:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 55
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: genomic RNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:58:

GUGGUUAUACC CAGUGAUUUU UUUCUCCAUAU AUGUCUUUGU CACCCUGCUU UUGCU

55

(2) INFORMATION FOR SEQ ID NO:59:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 53
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: genomic RNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:59:

CUGCAGAUGU AUCCUAUUUU AUAAUCUAGG UUUUGGUCGA AGGACACCCA UGG

53

(2) INFORMATION FOR SEQ ID NO:60:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 12
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: genomic RNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:60:

CCUGCUUUCG CU

12

(2) INFORMATION FOR SEQ ID NO:61:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 53 base pairs
- (B) TYPE: nucleic acid

(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: genomic RNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:61:

CUGCAUAUGU AUCCUAUUUU AUAACUAGA UUUUGGUCGA AACUCACCCA UGG

53

(2) INFORMATION FOR SEQ ID NO:62:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 108 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: unknown  
(D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:62:

CTAGACGCCC TGCAGCAAAA GCAGGGTGAC AAAGACATAA TGGAGAAAAA AATAACGTGA 60  
TTTTTTTCTC CATTATGTCT TTGTCACCCT GCTTTTGCTG CAGGGCGT 108

(2) INFORMATION FOR SEQ ID NO:63:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 42 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: unknown  
(D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: genomic DNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:63:

CCAAGCTTAT TAACCCTCAC TAAAAGTAGA AACAAGGAGT TT

42